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| UTILITY PATENT APPLICATION TRANSMITTAL **(Large Entity)** *(Only for new nonprovisional applications under 37 CFR 1.53(b))* | Docket No. END920000101US1 |
| | Total Pages in this Submission **4** |

TO THE ASSISTANT COMMISSIONER FOR PATENTS
Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

SOFTWARE MAINTENANCE

and invented by:

David N. Spiegel

If a CONTINUATION APPLICATION, *check appropriate box and supply the requisite information:*

☐ **Continuation**   ☐ **Divisional**   ☐ **Continuation-in-part (CIP)**   of prior application No.: _____

Which is a:

☐ **Continuation**   ☐ **Divisional**   ☐ **Continuation-in-part (CIP)**   of prior application No.: _____

Which is a:

☐ **Continuation**   ☐ **Divisional**   ☐ **Continuation-in-part (CIP)**   of prior application No.: _____

Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below

2. ☒ Specification having _____18_____ pages and including the following:

   a. ☒ Descriptive Title of the Invention

   b. ☐ Cross References to Related Applications *(if applicable)*

   c. ☐ Statement Regarding Federally-sponsored Research/Development *(if applicable)*

   d. ☐ Reference to Microfiche Appendix *(if applicable)*

   e. ☒ Background of the Invention

   f. ☒ Brief Summary of the Invention

   g. ☒ Brief Description of the Drawings *(if drawings filed)*

   h. ☒ Detailed Description

   i. ☒ Claim(s) as Classified Below

   j. ☒ Abstract of the Disclosure

P01ULRG/REV05

UTILITY PATENT APPLICATION TRANSMITTAL
(Large Entity)
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	4

Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*

   a. ☐ Formal   Number of Sheets _____

   b. ☒ Informal   Number of Sheets _____1_____

4. ☒ Oath or Declaration

   a. ☒ Newly executed *(original or copy)*   ☐ Unexecuted

   b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*

   c. ☒ With Power of Attorney   ☐ Without Power of Attorney

   d. ☐ *DELETION OF INVENTOR(S)*
       Signed statement attached deleting inventor(s) named in the prior application,
       see 37 C.F.R. 1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
   The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under
   Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby
   incorporated by reference therein.

6. ☐ Computer Program in Microfiche *(Appendix)*

7. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*

   a. ☐ Paper Copy

   b. ☐ Computer Readable Copy *(identical to computer copy)*

   c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☒ Assignment Papers *(cover sheet & document(s))*

9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*

10. ☐ English Translation Document *(if applicable)*

11. ☒ Information Disclosure Statement/PTO-1449   ☒ Copies of IDS Citations

12. ☐ Preliminary Amendment

13. ☒ Acknowledgment postcard

14. ☒ Certificate of Mailing

   ☐ First Class   ☒ Express Mail *(Specify Label No.):* EL598673413US _____

P01ULRG/REV05

Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*

16. ☐ Additional Enclosures *(please identify below):*

Request That Application Not Be Published Pursuant To 35 U.S.C. 122(b)(2)

17. ☐ Pursuant to 35 U.S.C. 122(b)(2), Applicant hereby requests that this patent application not be published pursuant to 35 U.S.C. 122(b)(1). Applicant hereby certifies that the invention disclosed in this application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing of the application.

Warning

An applicant who makes a request not to publish, but who subsequently files in a foreign country or under a multilateral international agreement specified in 35 U.S.C. 122(b)(2)(B)(i), must notify the Director of such filing not later than 45 days after the date of the filing of such foreign or international application. A failure of the applicant to provide such notice within the prescribed period shall result in the application being regarded as abandoned, unless it is shown to the satisfaction of the Director that the delay in submitting the notice was unintentional.

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UTILITY PATENT APPLICATION TRANSMITTAL **(Large Entity)** *(Only for new nonprovisional applications under 37 CFR 1.53(b))*	Docket No. END920000101US1
	Total Pages in this Submission **4**

Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	18	- 20 =	0	x $18.00	$0.00
Indep. Claims	4	- 3 =	1	x $80.00	$80.00
Multiple Dependent Claims (check if applicable) ☐					$0.00
				BASIC FEE	$710.00
OTHER FEE *(specify purpose)*					$0.00
				TOTAL FILING FEE	$790.00

☐ A check in the amount of _____ to cover the filing fee is enclosed.

☒ The Commissioner is hereby authorized to charge and credit Deposit Account No.   **09-0457** as described below. A duplicate copy of this sheet is enclosed.

    ☒ Charge the amount of   **$790.00**   as filing fee.

    ☒ Credit any overpayment.

    ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.

    ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

_____
Signature

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1701 North Street
Endicott, NY 13760

Dated: **11/06/00**

CC:

P01ULRG/REV05

APPLICATION

FOR

UNITED STATES LETTERS PATENT

APPLICANT(S) NAME: David N. Spiegel

TITLE: SOFTWARE MAINTENANCE

DOCKET NO. END920000101US1

INTERNATIONAL BUSINESS MACHINES CORPORATION

SOFTWARE MAINTENANCE

TECHNICAL FIELD

The invention relates to maintaining software on a computer
system and particularly to methods and systems for determining
which maintenance items are already installed on a system, which
items need to be added and insuring that prerequisite and
corequisite items are appropriately handled.

BACKGROUND OF THE INVENTION

Computer systems of all types require periodic and sometimes
unexpected or unplanned software maintenance. This applies to
personal computers of all types e.g. portables and desktops as
well as servers, and mainframes. When the computer system is
large, expensive, or serving many users, the maintenance
operations must necessarily be performed quickly and efficiently
to minimize disruption of service and possible loss of revenue
due to the computer system being unavailable during the planned
or unplanned maintenance operation. Furthermore, a large system
may have a large number of software items which were installed
over a long period of time each one having different maintenance
levels. Each item may also have various prerequisite items which
must be installed or removed prior to installing that particular
item or corequisite items which must be installed or removed
during the same session or previously.

Software maintenance items may be distributed in portable media such as magnetic tapes, floppy disks, CD roms, or they may be distributed over a network or other communication channels including the internet, dial-up through a telephone service, via fiber optic cable, or other data channels known in the art.

Performing software maintenance on computer systems, particularly large systems is therefore a complicated and difficult procedure, prone to errors which can disable a valuable resource for periods much larger than can reasonable be planned. A number of solutions have been developed, however, none have be found to be completely satisfactory for addressing the problems described above.

For example, Tyra et al. in US Patent 5,493,682, incorporated herein by reference, describe a system for software maintenance based on object oriented programming concepts. However a considerable amount of definition is needed for events required to maintain a software object including event identifiers and event conditions; object definitions including object identifier, attributes, and methods to be performed; and dependency objects. Software already installed on many systems may not have such definitions so that creation of such definition may be a prohibitively burdensome task in order to use Tyra's maintenance system.

Bizuneh et al. in US Patent 5,805,891 describe a system for distributing a software maintenance module by first verifying and testing the module prior to distributing it to the end users.

Glowny et al. in US Patent 5,805,897 describe a system for installing software on a remote workstation in a network having a plurality of workstations including a local workstation. Installation at the remote workstation is initiated and

5   controlled from the local workstation by communicating over the network.

Nakagawa et al. in US Patent 5,835,911 describe a software distribution and maintenance method using a plurality of user computers and a vendor computer having a software library. A

10   user computer sends an inquiry over the network to the vendor computer for the latest configuration of an object software. The inquiry may be made periodically or in response to a user initiating the software. The vendor computer receives the inquiry and generates update instruction information about the

15   latest version in the software library. The instruction information and a copy of the latest version object software are returned to the user computer via the network where the instruction information is processed to update the object software. Processing may include compiling and linking if

20   necessary.

Nishiyama et al. in US Patent 5,859,977 describe a network system having both a processing network and a separate maintenance network having high reliability and high responsiveness. All software maintenance is carried out using

25   the maintenance network thereby providing an overall system with high reliability and expendability.

Ahmad in US Patent 6,029,258 describes trouble shooting
software for a software application. A user launches the
trouble shooting software when encountering a problem with the
application. The trouble shooter attempts to find a problem
solution in an information store of problem solutions. If
located, the solution is passed to the user to install. If no
solution is found the trouble shooter connects to an internet
trouble shooting site and server to obtain additional solutions.
If no solution is found there, the trouble shooting software then
recommends that the provider of the application be contacted
about the problem.

deCarmo in US Patent 5,574,905 describes a method of editing
a multimedia file having segments located in different data
files, through use of a linked-list structure. Some editing
operations therefore result in changes to the linked-list
structure rather than the file itself, avoiding making file
copies.

Kiichi in Japanese Patent JP3237530 describes a system for
distributing software updates. An update object list file is
received by a personal computer from a host computer. The
personal computer then successively receives files of all update
modules based on this object list file and updates its software.

Despite the aforementioned developments there remains a need
for an improved software maintenance process.

OBJECTS AND SUMMARY OF THE INVENTION

It is therefore a principal object of the present invention to enhance the software maintenance art by providing a method of maintaining software on a computer system with enhanced capabilities.

It is another object to provide a system for maintaining such software wherein enhanced capabilities are possible.

It is yet another object to provide a computer system for maintaining software which can be applied in a facile manner.

It is a further object to provide a computer program product with enhanced capability to facilitate maintaining software.

These and other objects are attained in accordance with one embodiment of the invention wherein there is provided a method of maintaining software on a computer system, comprising the steps of, bringing up first and second host sessions on a computer system, starting in the first host session, a software recording application having data on first maintenance items applied to the computer system, starting in the second host session, a database application having a database of second maintenance items including prerequisite items and corequisite items corresponding to each of the second maintenance items, activating a maintenance application on the computer system, entering a first list of third maintenance items in the maintenance application, searching the database for the prerequisite items and corequisite items

corresponding to each of the third maintenance items on the first list, and adding the corresponding prerequisite items and corequisite items to the first list, thereafter determining from the software recording application which items on the first list have already been received, and adding those items not received to an order list, and ordering, receiving, and applying the items on the order list.

In accordance with another embodiment of the invention, there is provided a system for maintaining software on a computer system, comprising, means for bringing up first and second host sessions on a computer system, a software recording application having data on first maintenance items applied to the computer system, a database application having a database of second maintenance items including prerequisite items and corequisite items corresponding to each of the second maintenance items, a maintenance application having a first list of third maintenance items, means for searching the database for the prerequisite items and corequisite items corresponding to each of the third maintenance items on the first list, and adding the corresponding prerequisite items and corequisite items to the first list, means for thereafter determining from the software recording application which items on the first list have already been received, and adding those items not received to an order list, and means for ordering, receiving, and applying the items on the order list.

BRIEF DESCRIPTION OF THE DRAWING

The Figure is a flowchart in accordance with one embodiment of the invention.

BEST MODE FOR CARRYING OUT THE INVENTION

5   For a better understanding of the present invention, together with other and further objects, advantages and capabilities thereof, reference is made to the following disclosure and the appended claims in connection with the above-described drawing.

10   In the Figure there is shown a flowchart 10 of a method for software maintenance in accordance with the present invention. In step 12 two host sessions are brought up on a computer system. The computer system is normally the computer system on which one wants to perform software maintenance, however this is not

15   required in order to practice the invention. The computer system may be a mainframe, personal computer, laptop, portable or any other type of computer system on which it is desired to perform software maintenance. The computer system may further include an operating system such as an OS/390 architecture operating system

20   and may also include associated software program products such as JESx and networking software. The computer system may also include a data terminal and a supporting software such as an IBM program called Personal Communication/3270. The computer system is capable of bringing up host sessions such as may be provided

25   by its operating system software or by some other software

installed on the computer system.

In step 14 a software recording application is brought up in a first session. The recording application has data on first maintenance items which have been applied to the computer system in the past. One example of such a recording application is a program provided by IBM Corp. known as SMP/E. This program can record what software has been put on, track such software, record what software has been taken off, and record what software has been cloned, all on an OS/390 architecture system. The software recording application includes software for determining whether any particular maintenance item has already been received by the computer system.

In step 16 a database application is started in the second session. The database application has a database of second maintenance items known as PTF's The database also includes a listing of prerequisite and corequisite items for each second maintenance item. The database may also include descriptions known as APARS, of known problems in software items and mention of known fixes. One example of such a database application is an IBM program called Service Link. The database application includes a capability for searching the database of second maintenance items.

In step 18 a maintenance application is activated on the computer system. The maintenance application may be written in the REXX language and run in a window on the computer system. In step 20 a first list of third maintenance items are entered into

the maintenance application. This list may be a list of
maintenance items needed to be put on to the computer system.
The list may be entered via keyboard, importing a file, selecting
from some other list, or any other method known in the art for
entering a list into an application.

In step 22 the database of the database application started
in step 16 is searched for prerequisite items and corequisite
items corresponding to each maintenance item on the list entered
in step 20. The prerequisite and corequisite items found in this
searching are added to this list. Any particular item may
therefore appear multiple times on the list. Such duplicates may
be determined and removed to improve efficiency of the method,
although this is not required by the scope of the invention.

In step 24 it is determined from the software recording
application stated in step 14, which items on the list have
already been received and those not received are added to an
order list. Received shall be taken to mean stored in a file on
the computer system. The item may have been stored in a file
when the computer system was originally provided by the computer
manufacturer. It may have been stored as a result of an earlier
use of the present method, or as a result of some other
maintenance procedure, or a file may have been provided in any
other way known in the art for providing a file.

In step 26, the items on the order list are ordered,
received, and applied. Applied shall mean that a received item
has been installed on the computer system or updated an earlier

installed version of the item on the computer system. Ordering may be performed using the maintenance application activated in step 18, however, other methods of ordering maintenance software may also be used.

5   While there have been shown and described what are at present considered the preferred embodiments of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the scope of the invention as defined by the appended claims.

What is claimed is:

1   1. A method of maintaining software on a computer system,

2   comprising the steps of:

3   bringing up first and second host sessions on a computer system;

4   starting in said first host session, a software recording

5   application having data on first maintenance items applied to

6   said computer system;

7   starting in said second host session, a database application

8   having a database of second maintenance items including

9   prerequisite items and corequisite items corresponding to each of

10   said second maintenance items;

11   activating a maintenance application on said computer system;

12   entering a first list of third maintenance items in said

13   maintenance application;

14   searching said database for said prerequisite items and

15   corequisite items corresponding to each of said third maintenance

16   items on said first list, and adding said corresponding

17   prerequisite items and corequisite items to said first list;

18   thereafter determining from said software recording application

19   which items on said first list have already been received, and

20   adding those items not received to an order list; and

21   ordering, receiving, and applying said items on said order list.

1   2. The method of claim 1, wherein said computer system is a

2   mainframe.

1   3. The method of claim 1, wherein said computer system further

2   comprises an operating system.

1   4. The method of claim 3, wherein said computer system further

2   comprises network software.

1   5. The method of claim 1, wherein said software recording

2   application tracks what software has been put on or taken off

3   said computer system.

1   6. The method of claim 1, wherein said database application is a

2   service link.

1   7. The method of claim 1, wherein said receiving step further

2   comprises storing said items on said order list in a file on said

3   computer system.

1   8. The method of claim 1, wherein said applying step further

2   comprises updating said software on said computer system with

3   said items on said order list.

1   9. A system for maintaining software on a computer system,
2   comprising:

3   means for bringing up first and second host sessions on a
4   computer system;

5   a software recording application having data on first maintenance
6   items applied to said computer system;

7   a database application having a database of second maintenance
8   items including prerequisite items and corequisite items
9   corresponding to each of said second maintenance items;

10   a maintenance application having a first list of third
11   maintenance items;

12   means for searching said database for said prerequisite items and
13   corequisite items corresponding to each of said third maintenance
14   items on said first list, and adding said corresponding
15   prerequisite items and corequisite items to said first list;

16   means for thereafter determining from said software recording
17   application which items on said first list have already been
18   received, and adding those items not received to an order list;
19   and

20   means for ordering, receiving, and applying said items on said
21   order list.

1   10. The system of claim 9, wherein said computer system is a
2   mainframe.

1   11. The system of claim 9, wherein said computer system further
2   comprises an operating system.

1   12. The system of claim 9, wherein said computer system further
2   comprises network software.

1   13. The system of claim 9, wherein said recording application
2   tracks what software has been put on or taken off said computer
3   system.

1   14. The system of claim 9, wherein said database application is a
2   service link.

1   15. The system of claim 9, further comprising means for storing
2   said items on said order list in a file on said computer system.

1   16. The system of claim 9, further comprising means for updating
2   said software on said computer system with said items on said
3   order list.

1   17. A computer system for maintaining software, said system
2   comprising:

3   means for bringing up first and second host sessions on a
4   computer system;

5   means for starting in said first host session, a software

6   recording application having data on first maintenance items

7   applied to said computer system;

8   means for starting in said second host session, a database

9   application having a database of second maintenance items

10   including prerequisite items and corequisite items corresponding

11   to each of said second maintenance items;

12   means for activating a maintenance application on said computer

13   system;

14   means for entering a first list of third maintenance items in

15   said maintenance application;

16   means for searching said database for said prerequisite items and

17   corequisite items corresponding to each of said third maintenance

18   items on said first list, and adding said corresponding

19   prerequisite items and corequisite items to said first list;

20   means for thereafter determining from said software recording

21   application which items on said first list have already been

22   received, and adding those items not received to an order list;

23   and

24   means for ordering, receiving, and applying said items on said

25   order list.

1 18. A computer program product for instructing a processor to

2 maintain software, said computer program product comprising:

3 a computer readable medium;

4 first program instruction means for bringing up first and second

5 host sessions on a computer system;

6 second program instruction means for starting in said first host

7 session, a software recording application having data on first

8 maintenance items applied to said computer system;

9 third program instruction means for starting in said second host

10 session, a database application having a database of second

11 maintenance items including prerequisite items and corequisite

12 items corresponding to each of said second maintenance items;

13 fourth program instruction means for activating a maintenance

14 application on said computer system;

15 fifth program instruction means for entering a first list of

16 third maintenance items in said maintenance application;

17 sixth program instruction means for searching said database for

18 said prerequisite items and corequisite items corresponding to

19 each of said third maintenance items on said first list, and

20 adding said corresponding prerequisite items and corequisite

21 items to said first list;

22 seventh program instruction means for thereafter determining from

23 said software recording application which items on said first

24 list have already been received, and adding those items not

25 received to an order list; and

26 eighth program instruction means for ordering, receiving, and

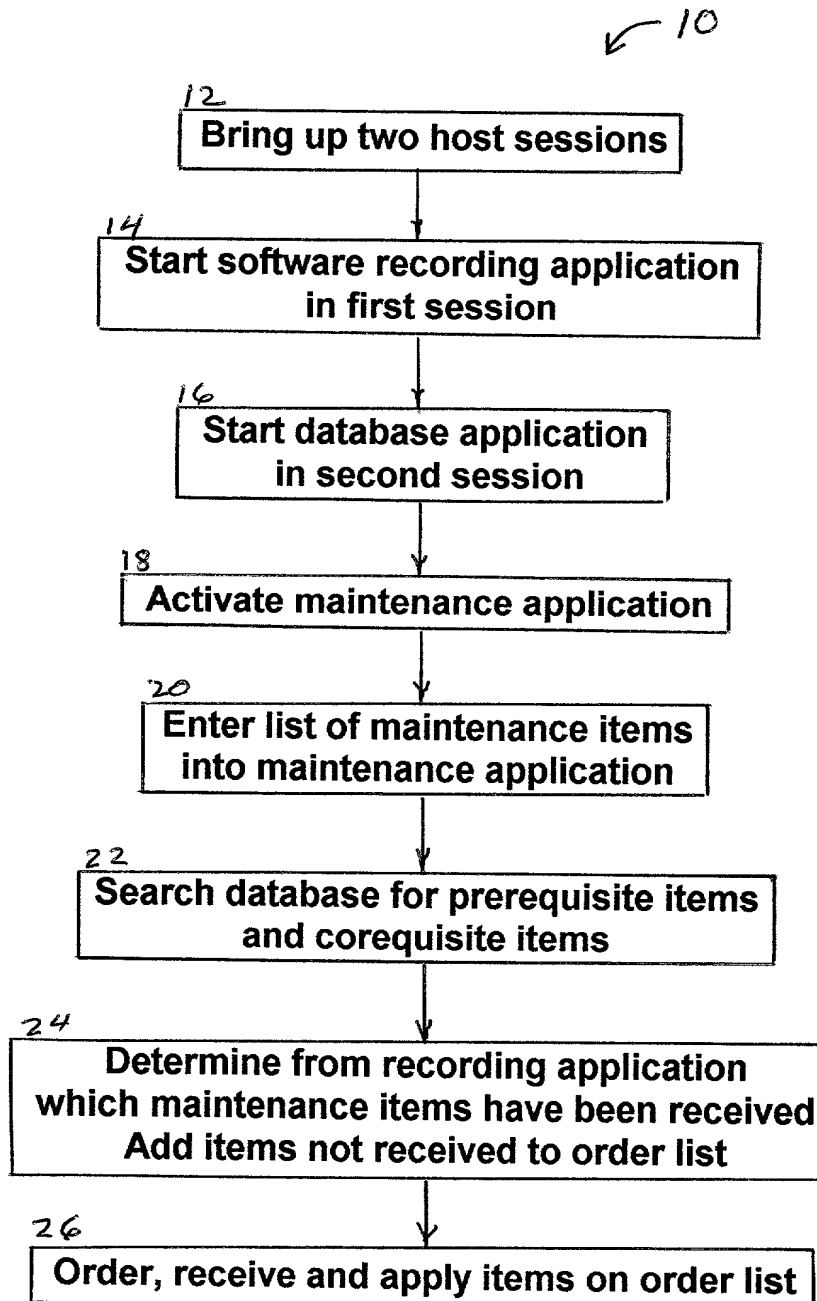27 applying said items on said order list; and

28 wherein all said program instruction means are recorded on said

29 medium.

ABSTRACT

SOFTWARE MAINTENANCE

Software is maintained on a computer system. A software

recording application having data on maintenance items already

5   installed on the computer system is started in a host session. A

database application is started in a second host session. The

database application has a database of maintenance items which

can be applied. Each item in the database includes prerequisite

and corequisite items. A maintenance application is activated on

10   the computer system and a list of maintenance items to be

installed on the computer system is entered. The database is

searched for prerequisite and corequisite items for each item on

the entered list and those items are added to the list.   Items

on the list which have already been received are determined from

15   the software recording application and those items not received

are added to an order list. Items on the order list are ordered,

received, and applied to the computer system.

10

12

Bring up two host sessions

14

Start software recording application
in first session

16

Start database application
in second session

18

Activate maintenance application

20

Enter list of maintenance items
into maintenance application

22

Search database for prerequisite items
and corequisite items

24

Determine from recording application
which maintenance items have been received
Add items not received to order list

26

Order, receive and apply items on order list

Docket No.
END920000101US1

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

SOFTWARE MAINTENANCE

the specification of which

(check one)

☒ is attached hereto.

☐ was filed on _____ as United States Application No. or PCT International

Application Number _____

and was amended on _____

(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)   Priority Not Claimed

			☐
(Number)	(Country)	(Day/Month/Year Filed)	
			☐
(Number)	(Country)	(Day/Month/Year Filed)	
			☐
(Number)	(Country)	(Day/Month/Year Filed)	

I hereby claim the benefit under 35 U.S.C. Section 119(e) of any United States provisional application(s) listed below:

_____	_____
(Application Serial No.)	(Filing Date)
_____	_____
(Application Serial No.)	(Filing Date)
_____	_____
(Application Serial No.)	(Filing Date)

I hereby claim the benefit under 35 U. S. C. Section 120 of any United States application(s), or Section 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. Section 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in Title 37, C. F. R., Section 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application:

_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
_____	_____	_____
(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

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Lawrence R. Fraley	Reg. No. 26,885
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William H. Steinberg	Reg. No. 28,540
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Sole or first inventor's signature	Date
Juan Mich Preper	October 27, 200
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Post Office Address	
Same as Above	

Full name of second inventor, if any	
Second inventor's signature	Date
Residence	
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Post Office Address	